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A comparison of a new mucolytic N-acetylcysteine L-lysinate with acetylcysteine: airway epithelial function and mucus changes in

Tomkiewicz RP, App EM, De Sanctis GT, Coffiner M, Maes P, Rubin B. M.

Pulmonary Research Group, University of Alberta, Edmonton, Canada.

A newly synthesized mucolytic agent, N-acetylcysteine L-lysinate (Nacystelyn) was studied. Tracheal mucus velocity (TMV), transepithelial potential difference, rheological properties, and ion content of collected airway secretions were evaluated in six healthy mongrel dogs after placebo, Nacystelyn (NAL) and acetylcysteine (NAC) metered dose inhaler (MDI) aerosols. Although TMV was increased and viscoelasticity decreased after both treatments, the treatment effect with NAL was significantly greater. Furthermore, NAL increased the negative PD and Cl⁻ secretions in the trachea, an effect not observed after NAC. Both compounds increased ciliary beat frequency (CBF) on the frog palate at a concentration similar to that approximated in dog airways. The increased mucociliary clearance could be partially explained by favourable rheological changes combined with stimulation of CBF. Since both compounds break disulfide bonds in mucus, the greater change in mucus rheology and clearance rate after NAL, without change in water content, could be explained by the increase in Cl⁻ content. Nacystelyn may combine different modes of action which synergistically cause an increase in the clearance rate of airway secretions.

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